TB214815W **Reg. No :.....**

Name :.....

B.Sc. DEGREE (C.B.C.S.) EXAMINATION, MARCH 2023

(2021 Admissions Regular, 2020 Admissions Supplementary / Improvement, 2019 ,2018 &2017 Admissions Supplementary)

SEMESTER IV - COMPLEMENTARY COURSE 2 (STATISTICS)

(For Psychology)

PY4CMT12 - STATISTICAL INFERENCE

Time : 3 Hours **Maximum Marks : 80**

Part A

I. Answer any Ten questions. Each question carries 2 marks **(10x2=20)**

1. Define Statistical Population
2. What do you mean by Statistical inference?
3. Define population
4. Define sample
5. Write down the z-statistic to test the equality of two population proportions.
6. State the statistic to test $\mu_1 = \mu_2$ with unequal and known population standard deviations when sample size is large.
7. Write any one of the two tailed test.
8. Write down the degrees of freedom of the Chi-square statistic with 5 × 4 contigency table. Justify.
9. Write down the F-statistic to test the equality of two population variances.
10. Differentiate between large and small sample test.
11. Write down the null and alternative hypotheses and critical region to test the equality of two population variances.
12. Write down the test statistic of paired t-test.

Part B

II. Answer any Six questions. Each question carries 5 marks **(6x5=30)**

13. Explain the terms 1) critical region 2) significance level 3) acceptance region
14. Explain Test statistic
15. What do you mean by Test criterion?
16. Describe the large sample test of the hypothesis that a mean population has a specified value when population standard deviation is known.
17. Explain the large sample test of equality of the mean of two populations when the population standard deviations are unequal and unknown.
18. Before an increase in excise duty on tea, 800 persons out of a sample of 1,000 persons were found to be tea drinkers. After an increase in duty, 800 people were tea drinkers in a sample of 1,200 people. Using stand error of proportion, state whether there is a significant decrease in the consumption of tea after the increase in excise duty.
19. In a certain factory there are two independent processes manufacturing the same item. The average weight in a sample of 250 items produced from one process is found to be 120 with a standard deviation of 12, while the corresponding figures in a sample of 400 items from the other process are 124 and 14. Is the difference in mean significant?
20. When the two samples are not independent then how will you test the equality of two population means in small sample test, explain.

21. Two samples are taken from normal populations with variances 3 and 2 respectively. Test whether the population means are equal or not.
    Sample1 : 3, 7, 11, 0, 7, 0, 4, 5, 6, 2, 4, 7, 2, 9.
    Sample2 : 5, 5, 4, 5, 4, 5, 7, 2, 6, 2, 2, 7, 2, 6, 4, 2, 5, 2

Part C

III. Answer any Two questions. Each question carries 15 marks **(2x15=30)**

22. Describe in detail about hypothesis and different types of hypothesis
23. Do male and female college students have the same distribution of living conditions? Use a level of significance of 0.05. Suppose that 250 randomly selected male college students and 300 randomly selected female college students were asked about their living conditions: Dorm, Apartment, With Parents, Other.The results are shown in the table below:

	Dorm	Apartment	With Parents	Other
Male	72	84	49	45
Female	91	86	88	35

24. Explain the small sample test for equality of two population means a) When the population standard deviations are known. b) When the population standard deviations are unknown.
25. Two random samples gave the following results:

Sample	Size	Sample mean	Sample standard deviations
1	10	15	2.45
2	12	14	2.78

    a) Test the equality of means of the two populations.
    b) Test the equality of population variances.